

## NIWASHI – A NEW TOOL FOR PEDOLOGY AND COVER-BED STRATIGRAPHY IN NEW ZEALAND \*

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### Introduction

The Japanese *Niwashi* – literally ‘garden master’ – is a new field tool for dressing soil profiles or cleaning down stratigraphic sections comprising softish or unconsolidated cover-bed deposits. Used for many years by Japanese pedologists, tephrochronologists, and volcanologists, the *Niwashi* has now become available in New Zealand. We have tried it out on a range of soils and various deposits and found it to be an excellent tool for field work in many situations.

### Niwashi and applications: ‘cutting-edge’ research

The *Niwashi* looks like a miniature hoe and comprises a 10-cm long sharp blade (either of stainless or hardened steel) affixed to a wooden handle 30 cm long (Fig. 1). The stainless steel model is designed for right-handed people but a heavier hardened-steel model, the so-called

‘traditional’ model, is available for left-handed users as well (the blade points to the right rather than to the left). The blade is minutely curved and has a very sharp cutting edge. It comes with a protective plastic sheath but we intend making heavier leather sheaths for it. The handle – easily marked off in 10-cm sections or whatever units are required (Fig. 1) – provides a scale for quick profile measurements. This 30-cm dimension fortuitously is a very useful one for New Zealand soils because this value, or multiples of it, is used extensively in the New Zealand Soil Classification (Hewitt, 1998). The *Niwashi* is very light and easy to carry around and use though we emphasise that appropriate care has to be exercised because its blade is sharp and potentially dangerous to both the carrier and to bystanders when in use.

Keep it away from children!

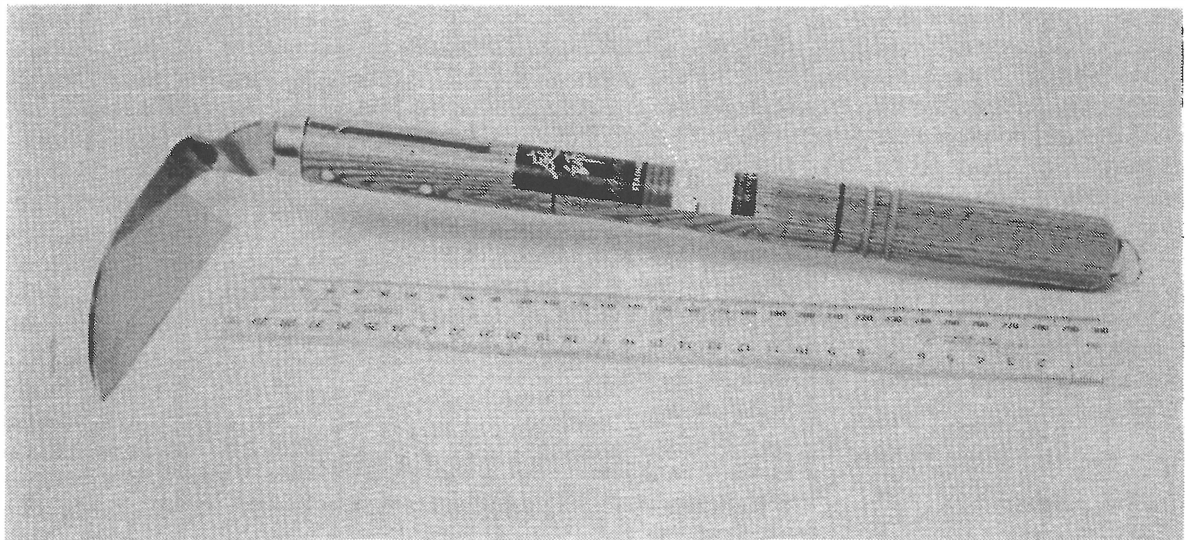
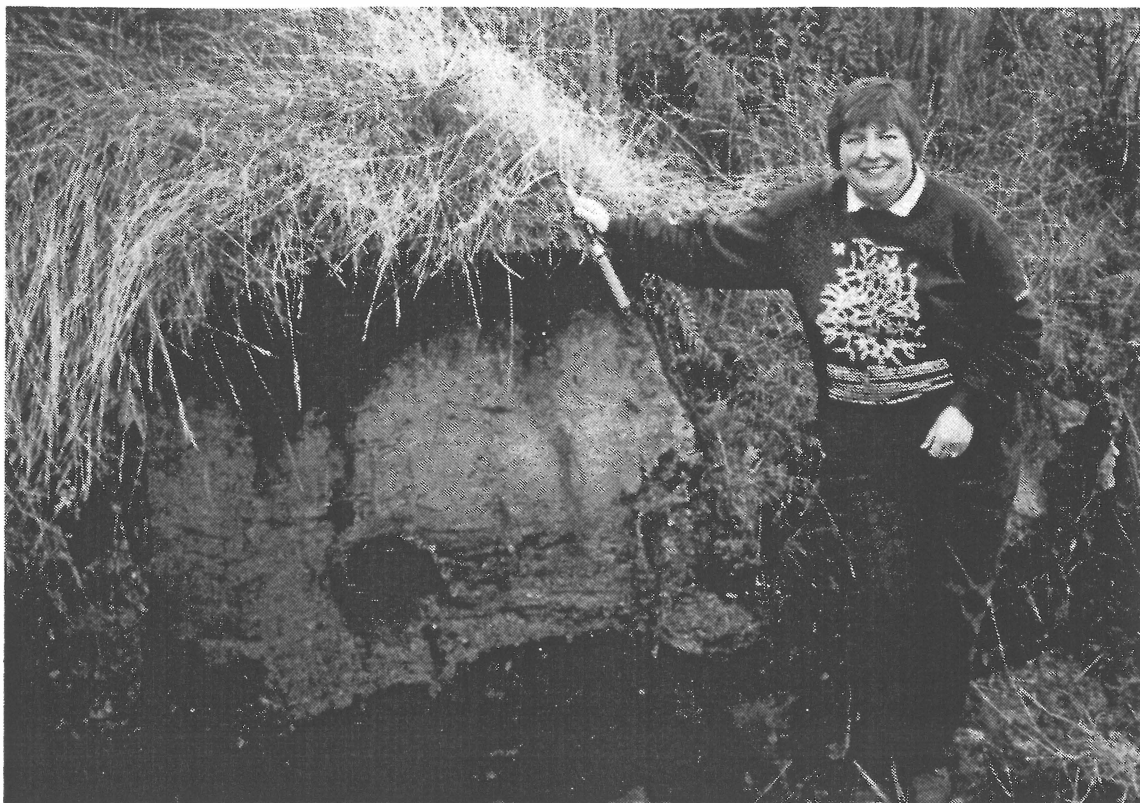


Fig. 1. The *Niwashi* (stainless steel model, right-handed). Scale marks at 10-cm intervals on handle. Photo: W. Peel.

We have applied the *Niwashi* to dressing soil profiles and exposing or clearing back unconsolidated cover-bed materials ranging from soft, pumiceous deposits in the Taupo Volcanic Zone (e.g. Taupo soil, Fig. 2) to heavy, clayey soils in Northland (e.g. Whangaripo soil, Fig. 3). It rips through most surficial vegetation and roots quite readily. On weakly-weathered tephra and associated soils and buried paleosols, and Pumice Soils and Allophanic Soils, it functions like a hot knife through butter. It is brilliant for exposing fine, short-range stratigraphic details or morpho-pedogenic features. Clayey or hard materials take more effort, however. Nevertheless, we have found that even the

light, stainless steel *Niwashi* works well on heavy, strongly-weathered Ultic Soils in Northland and on Granular Soils in the Waikato, with a surprising degree of pedality being preserved in the profile faces (Fig. 3). Hardpans or ortstein pans are not so easy to deal with but the *Niwashi* could be a useful adjunct to heavier implements for exposing surface features. In other words, if surficial soil or soft-rock material can be scraped away then the *Niwashi* will be helpful to a degree. Very dry and hard soils in roadside cuttings late in summer (for example, Pallic Soils) may be ‘untouchable’ by the stainless steel model but the heavier ‘traditional’ model might be usable.

\*Commonly known as *kama* (‘grass cutter’) in Japan. *Niwashi* is a brand name.



**Fig. 2.** Taupo soil (Immature Orthic Pumice Soil) developed on Taupo Ignimbrite over a buried paleosol, Mamaku Plateau. Visiting palaeoecologist Dr Valerie Hall (Queen's University of Belfast) is holding the *Niwashi*.  
Photo: D.J. Lowe.



**Fig. 3.** Whangaripo soil (Mottled Yellow Ultic Soil) developed on red-weathered sandstone and mudstone, Mahurangi Forest, Northland. *Niwashi* handle is 30 cm long. Photo: D.J. Lowe

In most situations the great advantage of the *Niwashi* over a field knife, for example, is the angle at which the blade 'meets' the profile face. This angle facilitates easy application to cleaning down the profile face (and usually eliminates painful knuckle contact with rough outcrops). A second feature is the sharpness of the blade, which helps in cutting through roots or firm peds or layers. Thirdly, the stainless steel model is lightweight yet seems remarkably robust if used appropriately. The manufacturers (see below) recommend that the *Niwashi* is washed in clean water and then dried after use, and we have found this to be necessary to avoid stains developing on the blade.

#### Conclusion

The *Niwashi* is a useful new field tool for pedologists and various Quaternary stratigraphers, tephrochronologists, and volcanologists and other Earth scientists who examine soils or cover-bed deposits or relatively soft rocks. It can often replace the spade in exposing sections or in dressing profiles or pit walls (but not for digging the pits, though).

Around \$35 in cost, the *Niwashi* is available (as a garden weeding implement) from a company in Auckland:

Eureka Enterprises, P.O. Box 35-116, Browns Bay, Auckland, Ph 09 476-2918; Fax 09 476-2917

**Acknowledgement**

Dr Richard Smith, physical volcanologist, imported the first *Niwashi* into our Department, thereby opening our eyes to its many capabilities.

**Reference**

Hewitt, A.E. 1998. 'New Zealand Soil Classification (2nd edition)'. *Landcare Research Science Series* 1. 133 pp.

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